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Syagoy site of Arka-Tabayakha clayey diatomite deposit: Lithology of rocks and mining potential

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Abstract

© 2018 Tomsk Polytechnic University, Publishing House. All rights reserved. Relevance. Modernization of infrastructure of the oil and gas complex of Western Siberia and development of the northern territories require the widespread use of local non-metallic raw materials. In areas that are almost directly adjacent to the main industrial sites in 1970-1980-s the colossal reserves of opal-cristobalite rocks - diatomites and opoka, were explored. They have a near-surface occurrence and industrial practice of their use in dozens of industries. Deficiency of natural raw materials in industrial sector of the north of the Tyumen region amounts to 50-70 %. This creates an economic basis for development of deposits of opal-cristobalite rocks. The Syagoy site - the largest in the near-Arctic zone Arka-Tabayakha deposit, due to its geological structure and confinement to the parallel-ridge relief, can be considered as a representative of other deposits of opal-cristobalite rocks in the north of Western Siberia. The main aim is the study of lithology of clayey diatomite of Syagoy site and analysis of engineering-geological conditions of Syagoy site, with a view to assess the economic feasibility of developing the field. The methods: field studies, X-ray diffraction, X-ray fluorescence analysis, differential thermal analysis, scanning electron microscopy, lithological and petrographic analysis. The results. The Syagoy site has huge forecast resources and relatively high quality of raw materials, however, the main limiting factors for development of deposit are economic and geological factors. The geomorphological and geocryological conditions of the territory of the parallel-ridge relief along with the total ice content of 50-60 % will have a critical impact on the cost of technological operations related to field development, transportation, storage and processing of raw materials, making the development of such deposits unprofitable. Real prospects for development of opal-cristobalite rocks in the Far North of Western Siberia exist for deposits that combine proximity to potential consumers of raw materials and do not form cryogenic hillocks and ridges.

Keywords

Clayey diatomite, Diatomite, Irbit formation, Lithology, Non-metallic minerals, Opal-cristobalite rocks, Parallel-ridge relief, Western Siberia, Yamalo-Nenets Autonomous District

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